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ABSTRACT

This paper describes a teacher education effort that developed conditions for teachers to be more effective learners about teaching and encouraged teachers' development of a personal understanding of educational issues. A group of teachers in one school established the Project To Enhance Effective Learning (PEEL) as an approach to encourage more active learning in their students. The teachers reflected on their day-to-day classroom experiences in the company of colleagues each week. The PEEL experience warrants close attention as an example of teacher education for a number of reasons: (1) It did not have a high cost structure; (2) teachers led the way in researching constructivist learning theories at the classroom level; (3) teachers learned from others with different discipline backgrounds; (4) teachers published accounts of their action research experiences for other teachers; and (5) problems with implementation of teaching methods become part of the research process. The paper reprints a model describing developmental stages in teachers' reflective judgement on the best way to teach. The paper concludes that preservice teacher education should incorporate more valid and extended school experience into educational programs. (Contains 11 references.) (JDD)

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Interpreting some different approaches to teacher education

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Interpreting some different approaches to teacher education

Introduction

The limited impact of research and "powerful" ideas on school practice and teacher education has been a common feature of the educational scene. A range of change and implementation strategies have been proposed (and some even tried) with "brute rationality"* (Fullan, 1991, p.95) still the most common basis for expecting ideas to influence practice. The lessons of past failures of changes which relied on rational argument are often swept aside by people who now try to bring about change. They often believe that past ideas were not as powerful as the ones they are now concerned with, and "brute rationality" should now be sufficient.

In teacher education, research findings and current ideas are often included in programs as lectures/seminars. However, there are certain characteristics of teacher education programs that make fundamental changes in teacher ideas and practice unlikely. I would like to suggest that in teacher education we overestimate the effect of "telling" or "teaching" teachers about good teaching practice. It seems logical to directly intervene by "showing and telling' but in doing so we run a risk of undervaluing the views and experiences that teachers bring to the teacher education program. Learning about teaching too often becomes "transmissive", even in situations when we are presenting ideas compatible with more constructivist views of the way learning occurs. **While we tend to overestimate what we can "teach" teachers, we may underestimate the effect we can have on developing the conditions for teachers to be more effective learners about teaching.**

This paper will explore a view of teacher education which places a higher priority on influencing a teacher's image of teaching where it is possible to be a learner, and carry out the teaching role in a way that allows the development of a personal understanding of educational issues. This would be in contrast to a view of teaching where initiatives are generally developed separately from the teacher practice and teachers are expected to implement these changes with some degree of fidelity.

This paper will outline a decade of experience with a project involving a number of teachers and teacher educators. It provides an example of one teacher education effort

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* "Brute rationality" is the simple notion that research findings or educational ideas are so logical and compelling that people should see the value and make appropriate changes.

where the impact of research on practice was powerful, with the findings in turn reshaping the nature of the research effort.

A research effort with an impact on teacher education

In the late 1970's the alternative conceptions/children's science perspectives gained prominence on the science education research agenda. The impact of these perspectives on teacher education followed a predictable pattern. There was some effort in revising texts and curriculum materials to address the misconceptions being identified. The persistence of misconceptions and evidence of student ability to maintain dual views (Fensham, 1991) meant that revision of curriculum materials alone was likely to have a limited effect. A review of science teacher education several years later (Discipline Review, 1989) revealed that most institutions had incorporated lectures and seminars on children's science and the associated constructivist learning ideas. The teacher education response had certainly been made at a telling/teaching level. Whether there were any subsequent changes at classroom level was more debatable.

There were three further developments that resulted in a more significant impact on classroom practice. Firstly, the "children's science" findings became incorporated into more comprehensive views of learning (eg. Osborne and Wittrock, 1985). Links were also developed with metacognitive research efforts so that the "children's science" findings were able to be interpreted more broadly and a wider range of responses became possible in teacher education. Constructivist perspectives became more "mainstream" as a wide range of research interests were drawn together (Northfield, 1991).

A second area of development was in the reform of some teacher education programs to make them more compatible with the constructivist approaches being advocated. The limitations of teaching/telling/transmissive approaches were recognised, and efforts made to value teacher experience and provide further experiences which might encourage learning about teaching, One teacher education program established a set of principles (See Table 1) which attempted to model the practice being advocated. This required teacher educators to reflect on their own practices and draw implications for teacher education - a challenge which proved as difficult as attempting to encourage the transformation of teachers and classrooms.

The third development involved a change in the way the research effort was conceived and conducted. Teachers began to play a part in introducing active learning

strategies into their classrooms and gaining an understanding of the process of implementation. One reason why telling/teaching has limited value in initiating change is that the realities of everyday classroom situations are ignored. In this case classroom teachers were leading the way, and researching the implementation, with significant teacher education implications emerging.

Table 1

Set of assumptions used as principles to develop a more "constructivist" approach in one teacher education program

Assumption 1:	The prospective teacher has changing needs and priorities which must be considered in planning and delivering the program.
Assumption 2:	The transition from learner to teacher is difficult to achieve and is greatly facilitated by having prospective teachers work in a collegial environment.
Assumption 3:	The student teacher is a learner who is actively constructing a view of learning and teaching based on personal experiences and strongly shaped by perceptions held before beginning the program.
Assumption 4:	The program should model the teaching/learning approaches being advocated.
Assumption 5:	Student teachers should see the preservice program as a worthwhile experience but only the first stage of a career-long professional development.

Teaching experience as a basis of teacher education - The PEEL project

In formal teacher education programs some activities have been developed which place teachers in genuine learning situations and have them reflect on personal learning experiences. Two examples include a six hour unit to teach non-biologists concepts of heredity and non-physicists the concept of reaction forces. Learning the concepts and learning about their own learning are both addressed in an attempt to have students experience a learning episode rather than have a lecture on constructivist learning. Another example involves an inservice approach where teachers are asked to gather data from the students about their level of understanding of a topic. The teachers are then supported in developing and presenting learning activities to address the misconceptions and ideas that have been identified. The teacher group then meets regularly to share their experiences. This format was a basis for the formation of a Children's Science Group who now meet regularly to discuss, develop and implement science concepts associated with student misconceptions.

In 1985, a group of teachers in one school set out to alter their teaching in ways that would encourage more active learning in their students. The term, PEEL (Project to Enhance Effective Learning) was used to indicate the focus for their efforts. The teacher commitment involved reflecting on their day-to-day classrooms in the company of colleagues for one period each week. The resulting teacher effort and published materials (eg. Baird and Mitchell, 1986; Baird and Northfield, 1992) provided an important means of translating research findings into teacher education and then classroom practice. The PEEL experience warrants close attention as an example of significant teacher education for a number of reasons.

(i) PEEL provided an example of professional development which did not have a high cost structure. In times of budget cuts for education, there has been a reluctance to engage in inservice education which has involved time release from the schools. High costs of teacher replacement have meant administrators have feared a never ending demand on limited resources. PEEL showed that significant professional development can occur as part of the normal teaching process and the key was creating conditions for teachers to become learners as part of their teaching role. This is not a "no cost" model, but PEEL and the teacher networks that have developed are generally maintained within the resources of a school, if this type of teacher activity is seen as a high priority among the staff.

For system administrators, this model of teacher education is not one that can be easily applied to implementing system priorities, as teachers will only invest time and effort in issues they see as important. Therefore system priorities would have to coincide with teacher priorities, and this has not always been the case in the PEEL project.

(ii) Only teachers could have tested the constructivist learning ideas in the classroom. Many educational "theories" founder at the level of practice. They are derived in the absence of detailed contextual understanding and there is no opportunity for reshaping and testing ideas in practice. In PEEL, the teachers interpreted and tested the ideas and so lead the way in researching constructivist learning ideas at the classroom level. The teachers continue to provide relevant experience to teacher educators and researchers, forcing the latter group to carefully reflect on **their** practices. Teacher educators/researchers need to be learners and

the PEEL teachers provided experiences which required careful reflection and reconsideration of existing ideas and practices in teacher education.

(iii) Science education research was the source of many of the constructivist, metacognitive and alternative conception ideas. Many of the teaching strategies being employed by teachers to probe student understanding and encourage more active learning also originated from science education (eg. concept maps, venn diagrams, interview about instances). One of the features of PEEL is the collegial relationship that develops between teachers from different disciplines. Teaching strategies are taken and reshaped in different discipline areas, providing useful variations, and a deeper understanding of teaching and learning. Teachers of the same class were able to share experiences with the same students. There were examples of teachers from other disciplines presenting papers at science education conferences. Professional development has been associated with opportunities for teachers to learn from others with different discipline backgrounds.

(iv) An important outcome of PEEL has been the publication of teacher accounts of their action research experiences for other teachers. It is rare for teachers to read other teachers accounts, and there is an increased level of interest and credibility in what has been written. The expectation and willingness of teachers to organise their ideas made them reflect on their experiences and gave them the confidence to extend their teaching ideas further. Teachers underestimate the value of **their** knowledge of teaching and learning and what **they** have to offer colleagues. One key to professional development is the provision of conditions which allow teachers to learn from each other. The wide teacher interest, in what is largely teacher experience set out in the PEEL publications and newsletters, can be interpreted as a desire to gain vicarious classroom experiences. It provides an opportunity for teachers to generalise from, and identify with, other teacher accounts and perhaps gain reassurance and deeper understanding of their own situations. The use of case studies and teacher accounts as important resources in teacher education is not new (Stake, 1987), but in the PEEL project it provided evidence that teachers' knowledge and experience is crucial in research on teaching and learning.

(v) In the PEEL project, what are often seen as the problems of implementation, become part of the research process. The aims of developing teaching approaches which encourage more active learning have been a focus for previous education movements and change efforts. To some extent it has been an external agenda with

teachers attempting to understand the ideas and address the implementation problems. With PEEL the underlying ideas are problematic and the implementation problems become part of the research effort. This perspective involves particular assumptions about learning to teach and the final section of this paper begins by outlining one relevant view of the way one comes to know about teaching and learning.

Learning about teaching: Some underlying assumptions

One contribution to the way adults engage in the process of understanding and knowing (eg. about teaching and learning) is provided by Kitchener and King (1992). They outline a model which explains the way a person addresses *"knowledge issues"* and defends *"a point of view on controversial issues"* (p.64). They describe a seven stage model which *"describes the shifts that occur in assumptions about knowledge and the way a person justifies beliefs or decisions"* (p.64). Table 2 sets out an interpretation of the seven stages, based on the ways teachers respond to the question "What is the best way to teach (a relevant topic)?"

Table 1

A view of the ways teachers justify their views of teaching (based on seven stage Reflective Judgement Model - Kitchener and King, 1992)

What is the best way to teach ....?

Stage	Response and Justification
1.	There is one way (eg. "show and tell" or "discovery learning").
2.	There are other ways but they are not as effective as my way.
3.	One way is best, other ways are less certain.
4.	Depends on the context and teacher preference (idiosyncratic situation).
5.	Depends on the way the situation is constructed and interpreted.
6.	Different approaches can be argued (No best way, generalisations not possible).
7.	The question is a research problem - a continual learning challenge for teachers.

There is some empirical evidence that teacher responses extend over the range set out in Table 2. Stages 4 - 7 indicate teaching is regarded as a problematic activity and it is this view which the PEEL teachers developed. Teachers who respond at a stage 7 level accept an action research perspective and teacher education is a matter of providing the conditions and support for continual learning. In the PEEL project the following issues became important as the teachers explored the best ways of teaching.

* How does one convince students about the value of more active and more independent involvement in learning activities when previous school experiences and assessment have lead to the development of passive learning approaches? In fact many intending teachers have been successful in essentially passive learning situations in their formal education. It is difficult for them to consider more active teaching strategies until they have experienced them as learners - a point which provides important implications for the way teacher education should be conducted (see Assumptions 3 and 4 in Table 1).

* Appropriate use of teaching/learning strategies. One review of teachers work in developing more active learning strategies (Baird and Northfield, 1992) describes more than 90 ideas. More importantly, teachers have realised the need to use a range of approaches. Overuse of a particular teaching strategy can lead to students developing routines to passively tackle the task (eg. completing a concept map by making and labelling links between concepts without a great deal of thinking).

* Emphasising active learning strategies quickly focussed attention on what student behaviours were being valued - the assessment procedures. Assessment approaches have not often included providing credit for relating new ideas to ideas from other subject areas or out-of-school experiences. Drafting and discussing initial ideas and searching for information require skills and activities that have been part of our assessment procedures. Teachers have realised that any shift to more active, independent learning has to be accompanied by a broader range of assessment approaches so that students receive credit for their efforts.

Teachers have been very interested in the PEEL project - it addresses teaching and learning issues in a way that has credibility because of the teacher voice in the way the ideas and activities are developed and described. Whether teachers then use the ideas to improve their classroom practice will depend on at least two major conditions. Firstly, they need to have the incentive and conditions to try some of the activities. Ideas and activities can be exchanged but understanding must develop in a personal way for each teacher, and new experiences must precede such understanding (Guskey, 1986). In the teacher education process we must establish the conditions that allow teachers to explore the impact of activities with colleagues.

A second related condition focuses on the importance of understanding the context or schooling and teaching for changes to effect practice. Classrooms are not places where more active teaching learning strategies are easily introduced. The dailiness of teaching (Lortie, 1975) means that the quality of teaching and learning will not always be high on the agenda. The management of 25 students and concern for their social welfare are always a high priority. The conditions necessary to increase teaching and learning priorities are difficult to establish and opportunities are rarer than outsiders think. Changes like those advocated in the PEEL project will only occur as we appreciate and work within the context in which teaching and learning occurs. The limited success that has been achieved can be attributed to a willingness to work with, and learn from, teachers. This learning has been about implementation and context as much as about learning and teaching ideas. The implications for teacher education are clear. New ideas must be grounded and explored in context rather than externally introduced. This implication applies to all levels of teacher education and suggests a clear message for the conduct of preservice teacher education with more valid and extended school experience a major priority for all programs.

References

Baird, J.R. and Mitchell, I.J. (1986) Improving the quality of teaching and learning. An Australian cast study - the PEEL project. Melbourne: Monash University.

Baird, J.R. and Northfield, J.R. (1992) Learning from the PEEL Experience. Melbourne: Monash University.

Discipline Review (1989) Discipline review of teacher education in mathematics and science. 3 vols. Canberra: Department of Employment, Education and Training.

Fensham, P.J. (1991) Science and Technology in P.W. Jackson (ed.) Handbook of Research on Curriculum, pp. 789-829. New York: Macmilllan International.

Fullan, M. (1991) The new meaning of educational change. Teachers College Press.

Guskey, T.R. (1986) Staff development and the process of teacher change, Educational Researcher, 15, pp. 5-20.

Kitchener, K.S. and King, P.M. (1992) The Reflective Judgement Model: Ten Years of Research in M.L. Commons, J.D. Sinnott, F.A. Richards and C. Armon (Eds.) Adult Development, Volume 2. New York: Praeger.

Lortie, D.C. (1975) School Teacher: A Sociological Study. Chicago: University of Chicago Press.

Northfield, J.R. (1991) Science education research and teacher education, in J.R. Northfield and D.J. Symington (eds) Learning in Science viewed as Personal Construction: An Australasian Perspective. Key Centre Monograph, Number 3. Perth, Australia: Kew Centre for School Science and Mathematics, Curtin University of Technology

Osborne, R.J. and Wittrock, M.C. (1985) The generative learning model and its implications for learning science. Studies in Science Education, 12, pp. 59-87.

Stake, R.E. (1987) An Evolutionary View of Programming Staff Development in M.F. Wideen and I.Andrews (eds) Staff Development for School Improvement. Falmer Press.